

INDUSTRIAL DISEASES AND THE PUBLIC HEALTH*

By WILLIAM C. HASSLER, M. D.
San Francisco

DISCUSSION by J. L. Pomeroy, M. D., Los Angeles; John J. Sippy, M. D., Stockton; Roscoe N. Gray, M. D., San Francisco.

THE revolution brought about in the various industries in the early part of the nineteenth century was the beginning of many industrial hazards formerly unknown, this in the main being due to the substitution of steam for water power. In the latter part of that century the hazards associated with machinery having steam as a motive power were multiplied, because of the increasing use of electricity and gasoline.

Those inventions brought into existence new machinery; and so subdivided labor that women and children became a factor in many classes of industry not previously open to them. As time speeds on, with increasing world population, we may expect many more such changes to take place. The social environment of our day is surrounded not only by greater comforts and pleasures in every walk of life than at any period in history, but also by greater hazards to life and longevity.

Ours is an age of machinery, of synthetic products, including even those of food and drink, and of new poisons in the mechanical arts and sciences. All these have brought new stress upon the body tissues of human beings, and new strains on the vascular and nervous systems. In other words, the mind and the body are in a continuous struggle for supremacy over the factors that operate insidiously or acutely, to injure the body structures or alter their activities in such manner as to interfere with the full enjoyment of life and its normal span of existence.

The end-results of such factors, whether caused by toxic substances, deleterious environments in factory or workshop, or by hazard to life and limbs, are classified as occupational diseases or diseases of industry. For the most part the diseases of industry are preventable.

Daily experience, however, brings to light exceptions to this ideal in prophylaxis, particularly in the profession of medicine and nursing. For example, hospitals require that all medical interns, nurses, and other employees must have had immunity treatment for typhoid, scarlet fever, diphtheria, and smallpox. Before such hospital attendants are assigned to the communicable disease division, they are checked to determine whether such treatment has been undergone. Yet annually we have illness and deaths and resultant industrial claims to meet because the virulence of the type of smallpox, scarlet fever, or diphtheria was greater than the protection the prophylactic agents were able to establish.

Other exceptions to absolute prevention in industrial hazards could be quoted, and more than legislative enactments will be necessary to control

absolutely such exceptions. In the future such exceptions will be reduced by proper education of the man or woman in industry, in personal, home, and factory hygiene, and in the specific hazards of occupations.

The moral and social influence which unions, workmen's clubs, lodges, and benefit and insurance societies can wield in prophylactic education in industrial fields has never been appreciated.

The medical profession as a whole, and especially physicians engaged in the practice of industrial medicine, must play a more definite rôle in educating the workmen and the public. The influence of the family doctor is very great in America, and if all family physicians did their full part in this work they would accomplish more than any lay commission. Not that we would expect the members of the medical profession to eliminate or replace these various lay societies, but rather that they should join with them and support their efforts, just as was done in the fight against tuberculosis.

PHYSICAL EXAMINATIONS

One of the great needs, and perhaps one that could be made to be an outstanding factor in the welfare of all who are in any way engaged in industrial occupations is that annual physical examinations should be made (in the specially hazardous occupations such examinations could be repeated every three months); complete in every detail, and with special inquiry as to the presence of any of the deleterious effects of hazardous trades.

It is easy to assess the disability or determine the degree of disability which may be the result of an accident. But to determine justly the disability resulting from lead or arsenic, the relation to industry of the tuberculosis of the baker or miner, of the tick fever of the cattleman and sheep herder, of the Malta fever of the milker, or of bronchitis, anemia, malnutrition in a man subject to gas poisoning, and so on, is often most difficult, because the causative factors of these conditions are often obscure, and their onset hard to fix. In addition their course is usually chronic.

A physical examination might bring to light a beginning arteriosclerosis, a nephritis, a heart lesion, a gastric ulcer, a beginning tuberculosis, infestation with protozoa, or a cancer, at such early date as would give a major chance of cure and so relieve future misery. Such physical examination in the writer's opinion would do more to cure and prevent the spread of syphilis and gonorrhea than all the present legislation.

Conditions and results now frequently charged to contributory negligence might be eliminated by the physical examination. Accidents are often the fault of an inability of coördination of the senses, such as the direct result of an old or improperly treated syphilis. For example, the foreman of a quarry gave the order to "shoot" and after a large boulder loosened by the blast had crushed his legs, he stated, "I saw it break and thought I had plenty of time before it could reach me." A physical examination proved that he had a triple plus Wassermann, a well-defined Romberg,

* Read before the Industrial Medicine and Surgery Section of the California Medical Association at its Fifty-Seventh Annual Session, April 30 to May 3, 1928.

and the characteristic light reactions and other evidence of a beginning general paresis.

On the other hand, the painter who slipped from a scaffold, and fell two stories to his death, had taken a swig of alcohol just prior to mounting the scaffold. Undoubtedly he contributed to his death, and a physical examination would not have changed the result.

THE SINGLE MAN AND THE ITINERANT LABORER

A very large group of workers, mainly composed of single men working in the woods, in mines and on construction work, and also itinerant laborers in agriculture, are sadly lacking in opportunity for medical examinations, when at the end of their season they migrate to the populous centers. Frequently their bedding, and often their clothing, is vermin-infested, with no place (at least in San Francisco) where the self-respecting man temporarily out of employment can go for a cleansing. Consequently such men may become potential menaces to the public health of the community. It would seem that the only solution would be to require all classes of labor to carry health status cards, just as the majority are now compelled to have union cards.

THE RELATIONSHIP BETWEEN DISEASES OF OCCUPATION AND PUBLIC HEALTH

The relationship of diseases of industry to other diseases and to the general public health is not only well established but exceedingly important from the economic viewpoint. That which menaces the individual, directly or indirectly, menaces community health; and health departments all over the land have one or more inspectors or social workers who are detailed to factory and workshop inspection.

TUBERCULOSIS

An illustration of this menace is well exemplified in tuberculosis among men in industry. The records of San Francisco reveal that, during the last twelve years, there were recorded 10,040 deaths from this disease. Of this number, 73 per cent were men and only 27 per cent were women. The heaviest death rate was between the ages of thirty and thirty-five, for which period 2414 men and 1772 women died from this disease. This shows that in San Francisco, as elsewhere, the tuberculosis hazard in the wage-earning group of men is especially great in the prime of life.

These men have generally established homes; they have wives and children, and usually these children are young. The experience of tuberculosis associations all over the world has proven that the major portion of the problems of social workers arise from this one phase of tuberculosis incidence; and that much of the preventive or curative work is concerned with this group of infected persons. A serious social and economic problem is brought into being when the breadwinner is diagnosed as having tuberculosis and is sent to a hospital or sanatorium. What is to happen to the family of such a patient? For in addition to the possibility of having infected one or more members of the family before the cause of illness was disclosed, debts accumulate, starva-

tion may threaten, the home and family may be broken up.

Again there is the case of the worker who has been unable to carry through an adequate course of sanitarium treatment, and who must return home. Such an unfortunate on his return may find a large extra burden of debt and no work to which he can turn his hand. The standard of living for such a family becomes lower and lower. In desperation the breadwinner may return to the work that originally caused his breakdown. In a short time he is again incapacitated; and returns to the hospital only to die. Thus is completed a vicious circle, which because of inadequate social machinery to aid in the rehabilitation of the tuberculous individual only increases the cost of the original problem.

How could this social and economic question be improved? The following are some of the remedial factors which come to mind:

1. Assistance of the dependents of those patients who are under institutional treatment.

2. Providing a changed and suitable employment for those sufficiently restored to health to be fit for work.

3. Social service work with the family, helping well members to increase their earning capacity.

4. A rearrangement of the home; or securing of more suitable home so that the patient's health may be maintained, and the danger of home cross-infection minimized.

5. Financial aid on a basis of no interest, and easy or long term payments.

From the writer's experience in some of these problems, he is led to believe that if the physicians who are doing industrial medical work were hired by the brawn and muscle instead of by the employing company or corporation, there would long ago have been created safer working conditions; and a saner and more far-reaching social service than now exists, and an entirely different form of workmen's insurance.

OTHER DISEASES

There are a number of other diseases of industry which are possible of communication to contacts of the workman. Among those are anthrax, or woolsorter's disease; hookworm disease, sometimes called "miners' anemia"; typhoid contracted from a polluted water supply of a factory or workshop.

Tularemia of the Rocky Mountain states, transmitted by the woodtick (*Dermacentor andersoni*), the deerfly (*Chrysops discalis*) and undoubtedly by other suctorial insects that feed on various rodents, rabbits, domestic animals, and man. This disease can be brought by the infected individual to remote communities. Malta fever, also called "undulant fever," contracted by milkers as in a recently reported epidemic in Phoenix, shows these infected milkers may remain carriers for two years and perhaps for life.

School teachers are prone to become victims of the communicable diseases of children. Then we have that large group of workmen who become carriers of the pathogenic organisms of a number of the contagious and infectious diseases; such

as conductors on our street cars who have during the past year in San Francisco carried diphtheria, scarlet fever, and infantile paralysis to their homes. A doctor carried poliomyelitis to his family within the past four months. In the San Francisco epidemic of poliomyelitis this year we found a large number of cases occurring in the families of men and women engaged in indoor work. Milkers on dairies have been responsible for outbreaks of septic sore throat, typhoid fever, diphtheria, and scarlet fever. Recently Malta fever was carried by milk distributors from the dairy where they were employed to consumers of unpasteurized milk. In many of the instances here cited there exists a direct relationship where cause and effect are directly traceable between industry and the public.

In the mind of every public health worker there must come the question: To what degree is the morbidity and mortality ratio of the workman's family due to the hazards of his occupation? Does it really matter whether the breakdown comes from lead or arsenic or poor lighting, or the accident from unprotected machinery? Need the disease of occupation necessarily be directly communicable like that of tuberculosis? Is it not a fact that anything which diminishes the efficiency or incapacitates the breadwinner causes a lowering of the standard of living that results in malnutrition, a lowering of resistance and a susceptibility to disease, especially when this incapacity comes into an existing environment that has all the concomitant factors such as dampness, poor light and ventilation, and a number of other things that surround the large family of the laborer. Not only is there in these cases as direct a relationship between occupational disease and general health as in the case of the specific diseases already mentioned, but the effects go further. For they tend to lower the moral standards, and thus often become factors in bringing patients to asylums, almshouses, and prisons.

Another public health problem that is now receiving greater attention than heretofore, has to do with the maternal and congenital effects of occupation on the prospective mother. Through the agency of our prenatal and postnatal clinics, an effort is being made to reduce the number of premature deliveries, of stillbirths, and of mortality of the babies in the first year of life, as well as to bring about a reduction in the maternal death rate. We know definitely that lead, for example, like syphilis or alcohol, may cause sterility; or if pregnancy occurs, more often than otherwise, the lead has a dwarfing and crippling influence upon the fetus, that may result in a child with permanent mental and physical defects.

The recognition of the hazards of industry to the workman is old; in fact, it dates back to 1713, when Bernardini Ramazzini of Padua published a treatise on tradesmen's diseases, but the recognition of their effects upon and relationship to public health is comparatively recent. The ill health among workers which sends four million people to hospitals each year has also changed our social viewpoint. The employers (and there are still many), who hold that their responsibility

ends with the payment of wages, and their compliance with government regulations, are out of step with modern civilization and should stand at the head of the list of failures in business. On the other hand, the employers who are appreciative of the facts that attention to the health of their employees and their families, and that provision of congenial working conditions more than justify the money expenditure involved, because of the contentment, the increased efficiency, less loss of time, the higher output and increased sales capacity of their employees, are constantly increasing.

Public health is an economic question that outranks all others in any community. The success and prosperity of commerce and industry, in fact the stability of the government itself rests upon the positive health of its citizens.

The solemn duty of bringing about better health standards in our various communities rests not only upon the health officials, but upon the professional men and women engaged in industrial medicine and industrial hygiene.

SUMMARY

In closing, the following suggestions are offered:

1. That diseases of industry have a close relationship with and, in many instances, a direct bearing upon health and community problems.
2. The state should enforce compulsory education of men and women in industry concerning special hazards of their work, as well as in industrial and home hygiene.
3. The coöperation of unions, lodges, and of insurance societies should be sought in the holding of lectures and clinics, demonstration of protective and preventive measures and first aid along the lines now practiced by the Bureau of Mines, the telephone companies, and other organizations.
4. Physical examinations and issuance of health cards to all workmen and women prior to employment should be required, and as often thereafter as the hazards of the industry indicate, in order to better maintain health. Such complete examinations should be made in every instance at least once a year.
5. A physical survey should be made of individuals engaged in the various industries for the purpose of establishing health standards.
6. Mortality and morbidity data should be collected and compiled; and reports and other information for the instruction and benefit of both workman and the public should be published.
7. A uniform method for recording medical data and records should be adopted.
8. Health and industrial authorities and social agencies should have coöperation in investigating and correcting problems connected with industrial hygiene.
9. The scope and the work of social service and industrial welfare bodies should be encouraged and broadened. Endeavor to bring about facilities not only for physical examinations, but for medical, dental and nursing service in all places of employment should be made.
10. Legislation should be promoted to compel all cities of the first and second class to establish

disinfecting stations as prophylactic and public health measures.

11. Universities should be encouraged to provide in their medical schools facilities for the proper teaching and training of medical practitioners in industrial medicine.

To these might be added a recommendation that physicians engaged in industrial medicine and welfare work, backed by employers of labor in any and all branches, might well form and hold annual conferences with officials and representatives of labor to insure uniformity of reports and records and promote further action on the various other subjects pertinent to industrial hygiene.

1085 Mission Street.

DISCUSSION

J. L. POMEROY, M. D. (330 North Broadway, Los Angeles).—California, so largely in times past an agricultural state except in the vicinity of the larger cities, is now undergoing a rapid change to industrial centers. It is time that study is given to this problem. Doctor Hassler has laid out a splendid plan for developing industrial medicine and industrial hygiene. In the Los Angeles County Health Department we have under consideration the opening of a division of industrial medicine and hygiene to take special care of this problem. While conditions differ in different parts of California and the character of industries is somewhat different, there is no question whatever that special attention should be paid to industrial diseases.

✱

JOHN J. SIPPY, M. D. (San Joaquin Local Health District, Stockton).—Our old ideas that industrial hazards were limited to the mechanical trades are vanishing, as evidenced by more and more liberal interpretation of employers' liability laws. Doctor Hassler has indicated need of still wider scope in such enactments, as well as of more intensive education of both employer and employee. His comment that if "industrial physicians were hired by brawn and muscle instead of by the employing company or corporation" is pertinent, especially when one views the variation of concern felt for the health of the employee by the companies who operate health and hospital associations in conjunction with employees, and those which do not. California has a serious problem in the itinerant laborer in that responsibility for his welfare is hard to fix upon any county or municipality. Undoubtedly, on account of the brevity of employment of so many of these persons, physical examinations and observations would prove an economic burden upon either employees or employers, even granting the remote notion that they might be brought to perceive the ethics of the procedure. Undoubtedly the state will eventually assume some such responsibility, either directly or by delegation of authority to county and city. Certainly the latter units must seek some such remedy if expenditures for hospitals and social relief activities are to be curtailed. It is a nice problem for joint solution by the physicians, health officials, and welfare workers.

✱

ROSCOE N. GRAY, M. D. (333 Pine Street, San Francisco).—Uniform records of morbidity must be developed and careful studies made to determine how we may best proceed to put Doctor Hassler's suggestions into practical operation. He has pointed the way, groping through the darkness of our limited knowledge, but he would be the first to agree that even his trained mind is handicapped by inexact information, leading to recommendations which may not all be practical. He therefore pleads that uniform records be adopted, physical surveys of those at work be made to develop standards of health, and the results of these studies be published for the benefit of society. Such must be done before safe progress may be made.

To encourage the scope of social service and industrial welfare bodies and to provide medical, dental

and nursing service in all places of employment cannot be done without a very close approach to state medicine. I do not believe we are ready to lose our individual identity through paternalistic provision of such service by our employers. A better plan than that developed in Great Britain and Germany must be found before we can successfully go too far with providing compulsory medical service in all places of employment.

It seems strange, when compensation laws are in force in nearly every state, and it is accepted that the best industrial medical work requires special thought and training, that so little effort is made by our medical schools to teach industrial medicine. The industrial surgeon is a specialist with no school for special training other than "The College of Hard Knocks."

How far the state may safely enforce compulsory education in industrial and home hygiene cannot be determined. To even approach worthwhile education would require a tremendous addition to our present teaching institutions. I doubt if such education should be applied through compulsion to men and women until we have so taught our children. Children are easier to teach, and the facilities are at hand. Why not use them more fully to teach home and industrial hygiene?

Physical examination will undoubtedly uncover many conditions that ultimately lead to untold suffering, but who is to pay for compulsory examinations to be made at least yearly? The cost would be millions annually. Is the cost to be assessed against industry, the individual, or the state? Vastly increased policing is the price of compulsory health cards before employment to insure that the diseased do not avoid the law. More thought must be given to the problem of placing those physically not fitted to the occupation they desire to follow. Otherwise compulsory health cards before employment will start a hornet's nest of injustice and discontent.

We should request Doctor Hassler to submit specific legislation leading to disinfecting stations in large cities as a public health measure. His brief for their necessity seems unanswerable and he is entitled to the backing of the medical profession in securing the passage of such legislation at an early date.

THE LURE OF MEDICAL HISTORY

THE STORY OF DIGITALIS

By WILLIAM DOCK, M. D.
San Francisco

NO medicinal plant has been more fortunate in its introduction to general use, and none more lauded, abused and discredited than the foxglove. It was first described in *Campanula sylvestris* (Waldglocke), by Hieronymus Bock in 1539. It was named *Digitalis purpurea* in 1542 by the botanist and professor of medicine, Fuchs, of Tübingen. The word "foxglove" occurs in English herbals as far back as the eleventh century Saxon "Leechbook." The plant was primarily used for external application, although it had some reputation in the cure of scrofula, cough, and epilepsy. However, by 1770 it seems to have been widely used, chiefly by laymen, in certain parts of England for treating dropsies. Hearing of such cures, William Withering of Birmingham began prescribing the drug to his patients, but toxic symptoms caused him to hesitate in continuing its use. Often, with drugs used by quacks, the cure of some prominent person leads to intensive study by competent physicians. It was such a cure of hydrops pectoris in the principal of Brazen Nose College, Oxford, that led Withering to continue his investigations on digitalis. His friends also took up the drug for the treatment of dropsical